MICRO CASE 13:

In **December**, a **71-yr old man from a nursing home** was brought to the hospital in **acute respiratory distress**. He had been in his usual state of health until 10 p.m. the previous day, when he suddenly developed **fever, chills**, muscle **aches, cough**, and **prostration.** Several other nursing home residents had developed a similar illness during the previous week.

His past medical history was unremarkable, and he had not seen a physician in the past year.

* PHYSICAL EXAM: lung exam unremarkable
* DIFFERENTIAL:
  + Adenovirus
  + Bacterial pneumoniae
  + Chlamydophila pneumonae
  + Influenza (types A, B, or C)
  + Mycoplasma pneumonae
  + Coxicella burnetti (Q fever)
  + Rationale:
    - In the appropriate season, typical clinical features are usually adequate to make a diagnosis of influenza. Other viral causes are generally not as acute or severe in onset. The presence of headache and myalgia is not as common with bacterial pneumonia. Atypical causes of pneumonia are generally associated with a more indolent presentation. Q fever is often associated with animal exposure.
* DIAGNOSTIC WORK-UP
  + Rapid Ag testing or direct immunofluorescence antibody (DFA) of nasopharyngeal (NP) swab or nasal aspirate
  + Gram stain and cultures of sputum to rule out bacterial pneumonia
  + Isolation of virus (viral culture) of NP swab or nasal aspirate
  + Serology
* SOURCE = Influenza
* COURSE
  + Patient was admitted to hospital and given supplemental oxygen and i.v. hydration. He was also given antipyretics and was placed on cefotaxime, erythromycin, and amantadine (since influenza was predominant in the community at the time).
* MICROBIOLOGIC PROPERTIES
  + Remember H and NA Ags; (-) ssRNA genome with 8 segments
  + Current human types are A (H1N1) and A(H3N2).
  + Remember antigenic shift due to genetic reassortment, possibly leading to generation of new strains. FAST
  + Antigenic drift due to point mutation, leading to change in configuration of specific epitope. SLOW
* MANNER OF EXPOSURE
  + Influenza A was predominant in the community at the time
  + Spread person-to-person primarily by coughing and sneezing. Also by direct contact with respiratory secretions.
  + Avg. incubation is 48 hrs
* Route of infection, Tissues they reside in and transmission to others
  + Mucosal immunity mediated by IgA. If antibodies fail, the virus infects the epithelial cells lining the trachea and bronchi. NA degrades the protective layer of mucus, allowing the virus to gain access to the cells of upper and lower respiratory tract. Despite the systemic symptoms, VIREMIA IS ABSENT. Virus replicates in mucous secreting ciliated cells. The **cytokines** released **cause the systemic symptoms of influenza**.
* Treatment
  + Amantidine and rimantidine target H. Though they NEED TO BE GIVEN WITHIN 48 HRS OF ONSET. Given for 3-5 days. Effective against Influenza A (not B or C).
  + Osteltamivir and zanamir target NA. Effective against Influenza A and B.
  + **Aspirin** not recommended in children with influenza (reyes syndrome)
* Vaccine Design
  + Annual killed vaccine recommended
  + Antivirals recommended in setting of an institutional outbreak